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ABSTRACT

The purpose of this study was to examine the construct validity of a classroom communication apprehension scale for a sample of 196 high school students in Japan. Exploratory and confirmatory factor analyses were used. The original English version of a classroom communication apprehension scale (M. Neer, 1987) consisted of 20 items representing 2 hypothesized dimensions of classroom communication apprehension: Confidence and Participation. The Japanese translation of the scale contained the same items representing the same two dimensions. The internal consistency reliability for the two subscales of the translation was 0.81 and 0.82 respectively. Exploratory factor analysis using a principal axis factoring method with an oblique (promax) rotation extracted four factors with eigenvalues greater than 1, collectively accounting for 61% of the total variance. Results of the confirmatory factor analyses provided little support for the factor structures of both the a priori two-factor model and a four-factor model. The study suggests that for the sample of high school students in this study the Japanese version of the classroom communication apprehension scale is multidimensional. Study results provide little support for the presence of the two hypothesized dimensions. The findings of this study suggest the need of redefinition of the dimensions of classroom communication apprehension. (Contains 4 tables and 21 references.) (SLD)

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A Validity Investigation of a Japanese Version of a Classroom Communication Apprehension Scale

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Abstract

For a sample of 196 high-school students the purpose of the present study was to examine the construct validity of a classroom communication apprehension scale. Exploratory and confirmatory factor analyses served as methods of investigation. The original English version of a classroom communication apprehension scale (Neer, 1987) consisted of 20 items representing two hypothesized dimensions of classroom communication apprehension: *Confidence* and *Participation*. The Japanese translation of the scale comprised the same items representing the same two dimensions. The internal consistency reliability for each of the two subscales was .81 and .82, respectively. Exploratory factor analysis using a principal axis factoring method with an oblique (promax) rotation extracted 4 factors with eigenvalues greater than 1, collectively accounting for 61% of the total variance. Results of confirmatory factor analyses provided little support for the factor structures of both the *a priori* two-factor model and a four-factor model. The study concluded that for a sample of high school students in the present study the Japanese version of the classroom communication apprehension scale is a multidimensional scale; however, it provided little support for the presence of the two hypothesized dimensions. The findings of the present study suggested the needs for redefinition of the dimensions of classroom communication apprehension.

Background

McCroskey (1977) defines communication apprehension (CA) as "an individual level of fear or anxiety associated with either real or anticipated communication with another person or persons" (p. 78). Social contexts in which communication takes place contribute to differential levels of CA, which in turn influence individuals' attitudes and behaviors toward oral communication in given contexts. McCroskey & Richmond (1980) identified four broad communication contexts (group discussion, meetings, interpersonal conversations, and public speaking) mediating levels of CA. McCroskey (1982) then developed a scale titled the Personal Report of Communication Apprehension (PRCA-24) to measure individuals' predisposition to oral communication. Many researchers employing the PRCA-24 investigated the effect of CA on individuals in workplaces and schools. The results indicated an inverse relationship between CA as measured by the PRCA-24 and evaluation on subordinate-supervisor communication (McCroskey, Richmond, & Davis, 1986; Richmond, McCroskey, & Davis, 1986) and academic performance (Chesebro, McCroskey, Atwater, Bahrenfuss, Cawelti, Gaudino, & Hodges, 1992; McCroskey, Booth-Butterfield, and Payne, 1989; McCroskey & Payne, 1986).

In the classroom, where real or perceived evaluation is constantly in progress, it is natural to expect that students experience some degree of CA, some experiencing more than others. CA becomes problematic in the classroom when it adversely affects students' attitudes and behaviors toward learning, causing students to avoid and withdraw from active participation in learning activities, to the detriment of academic performance and evaluation. In his study to identify sources and treatments of CA specifically associated with classroom discussion, Neer (1987) developed the Class Apprehension about Participation Scale (CAPS). The CAPS by his definition measures classroom-specific communication apprehension (CCA), whereas the PRCA-24 measures communication apprehension across diverse situations. The CAPS includes items specifically reflecting students' behaviors toward oral communication in the classroom. The study (Neer, 1987) used in the development of the CAPS reported that the scale predicted classroom communication apprehension more accurately than the PRCA-24.

Culture sets values and norms for communication patterns (Trenholem and Jensen, 1992; Zimbardo, 1977). The effect of cultural variability on CA has been studied (Hackman, Tammy, & Barthel-Hackman, 1993; Klopf, 1984; Watson, Monroe, & Atterstrom, 1989), with the resulting hypothesis that some cultures would be more likely to instill higher degrees of CA than others. Recent studies (Olaniran and Roach, 1994; Olaniran and Stewart, 1996), using the PRCA and the CAPS, investigated differences between U.S. samples and Nigerian samples in patterns and effects of CA in the classroom. The observed differences reported in the study suggested that the CA was manifested differently in different cultural groups, confirming cultural influence on communication patterns. A major weakness of these studies, however, is the failure to investigate the suitability of the scales for Nigerian samples. A scale developed to measure CA in the context of one culture may not yield accurate measurement of CA in the context of another culture. A true cross-cultural comparison of scores requires a valid theoretical framework of CA underlying the development of scales and their structural equivalence.

The present study investigates the reliability and construct validity of the Japanese version of the CAPS. It is a first step toward cross-cultural comparisons of CA in classrooms between Japan and the U.S.A. Distinctive cultural and linguistic boundaries separate Japan and the U.S. Past studies indicated that Japanese students would display behaviors indicative of higher levels of apprehension and anxiety when compared with their American counterparts. However, to the present not much empirical study has been done. The findings of the present study will provide information important to the successful development and validation of a scale for future cross-cultural comparisons of scores of CA between the two cultures. A major purpose of the present study, therefore, is to investigate through empirical data analysis whether the theoretical and structural framework underlying the original English version of the CAPS applies to a sample of high school students in Japan.

Purpose

The purpose of the present study was to investigate the reliability and factorial structure of the CAPS in a cross-cultural setting. More specifically it attempted to determine whether the Japanese translation of the CAPS would reveal the *a priori* two dimensions (*Confidence* and *Participation*) for a

sample of Japanese high school students. Exploratory and confirmatory factor analysis served as methods of investigation.

Method

Participants

A total of 196 high school students attending a public coeducational high school in Kagawa, Japan completed the Japanese translation of the CAPS. The school is a highly competitive college preparatory school, placing 90% of graduating students successfully in various colleges and universities throughout Japan. The school curriculum requires all students to complete three years of high school work in the first two years and devote the last year of high school solely to preparation for college entrance examinations. The subjects included 94 males and 100 females (2 failed to indicate) in the first-year and second-year. They are equivalent to high-school freshmen and sophomores in the U.S. with age between16 years old and 17 years old. School policy prevented third-year students (seniors) from participating in the study. The participants represented varying socioeconomic backgrounds, academic interests and achievement.

Instrument

The CAPS (Neer, 1987) is a 20-item self-reporting questionnaire purporting to measure two underlying dimensions of classroom communication apprehension: *Participation* and *Confidence*. Items with even numbers (1,3, 5, …9) constitute the *Participation* factor subscale, whereas items with odd numbers (2, 4, 6, …10) constitute the *Confidence* factor subscale. Items in the *Participation* subscale relate to facilitating or inhibiting behaviors toward class discussion. Items in the *Confidence* subscale relate to absence or presence of general apprehension accompanied by nervousness or tension and evaluation apprehension, a particular form of fear accompanying evaluation.

The first author of this paper translated the Classroom Apprehension about Participation Scale (CAPS) (Neer, 1987) into Japanese. A bilingual college professor who had not seen the original CAPS translated it back to English. Both researchers in the present study judged that the translation appropriately reflected conceptual equivalence of the original English scale. The Japanese translation of the CAPS

contains the same 20 items representing the same two factor subscales. Each item allows five alternative responses ranging from *Never* (1) to *Always* (5). For each subscale the total possible scores range from a minimum of 10 to a maximum of 50, higher scores indicating stronger manifestation of classroom communication apprehension.

Procedure

Two hundred sets of questionnaire and answer sheet were mailed to a member of the Kagawa Board of Education, who then passed the questionnaires to the principal of a participating high school. A cover letter accompanying the questionnaires explained the purpose of the study and provided the necessary instructions for completing the questionnaire. The instructions included: (1) participants respond anonymously, (2) there are no right or wrong answers, and (3) participants choose only one answer. Homeroom teachers distributed the questionnaires and the students took the questionnaires home to complete it. The completed questionnaires were collected and mailed back to the researchers. All the 200 questionnaires were returned, of which 4 were excluded from data analyses due to missing data.

Data Analyses

The SPSS Plus (SPSS, 1990) and the EQS: Structural Equations Program (Bentler, 1998) software packages were used to perform the following statistical analyses:

(1) The mean and standard deviation of each of the scores on the two factor subscales were calculated.

(2) Correlation coefficients between two factor subscales were computed.

(3) To examine the internal-consistency reliability of scores on each of the two factor subscales, a coefficient alpha estimate of internal consistency was calculated.

(4) To further examine internal consistency reliability, item-subscale correlation was obtained. Correlation coefficients were computed for each of the 20 items and the two factor subscales.

(5) To examine the dimensionality of the scale, a correlation matrix of the 20 items in the scale was submitted to exploratory factor analysis using an oblique (promax) rotation. If the scale truly represents the two *a priori* factors (*Confidence* and *Participation*), exploratory factor analysis should recover two factors.

Two criteria employed to determine the number of factors were: (a) eigenvalues greater than 1 and (b) a total variance explained greater than .60.

(6) Confirmatory factor analyses were performed to estimate overall fit of the models. The models submitted to analyses included: (a) a one-factor model indicating that the scale measure one common underlying factor rather than two discrete factors as was originally intended, (b) an oblique two-factor model indicating that the items truly represent the two factors as was originally intended, and (c) an oblique four-factor model indicating the items in the scale represent four factors. The decision to include the last model was based on the results of exploratory factor analyses.

Results

Internal-Consistency Reliability of the DOSC, Form H Scores

Table 1 shows the estimates of internal-consistency reliability as well as the mean and standard deviation of the scores on the two factor subscales.

Insert Table 1 about here

The mean and standard deviation of scores on each of the two factor subscales (*Confidence* and *Participation*) was 28.93 (7.93) and 26.58 (6.14), respectively. For each of the two factor subscales, *Confidence* and *Participation* the corresponding estimate of internal-consistency reliability (alpha) was .81 and .80, respectively, establishing moderate internal consistency reliability (> .70). The results of item-subscale correlation revealed that 18 items out of 20 correlated higher with their target subscale. Two items (item 9 and 15) intended for the *Confidence* subscale correlated higher with their non-target subscale *Participation*.

Exploratory Factor Analyses

The SPSS (1990) was employed to perform exploratory factor analyses. A principal axis factoring method with an oblique (promax) rotation extracted 4 factors with eigenvalues greater than 1, collectively accounting for 61% of the total variance. The eigenvalue was 6.77 for Factor 1, 2.84 for Factor 2, 1.56 for

Factor 3, and 1.08 for Factor 4. Table 2 shows factor loadings of items in an oblique (promax) four-factor solution. Items 9, 12, 15, 6, 18, and 14 loaded on Factor 1, items 17, 13, 7, 19, 5, and 11 on Factor 2, items 16, 4, and 2 on Factor 3, and items 3, 10, 20, 1, and 8 on Factor 4.

Insert Table 2 about here.

Next an oblique two-factor solution (*a priori*) was obtained by specifying the number of factors to be extracted as two. Table 3 shows factor loading of items in an oblique (promax) two-factor solution.

Insert Table 3 about here.

Factor 1 (eigenvalue = 6.77) and Factor 2 (eigenvalue = 2.84) together accounted for 48% of the total variance. Items 12, 9, 15, 18, 6, 14, 10 and 4 loaded on Factor 1. Items 17, 19, 11, 7, 13, 5, 2, 3, 1, 8, 16 and 20 loaded on Factor 2. Both factors were saturated with items not intended for them, indicating that they represent dimensions that could not be explained by the *a priori* two dimensions (*Confidence* and *Participation)*. The results suggested that for sample of the high school students in the present study the Japanese translation of the CAPS is a multidimensional scale. However, examination of the eigenvalues (greater than 1) and the percentage of variance explained (greater than 60%) indicated that a four-factor solution would be a better solution than the *a priori* two-factor solution.

Construct Validity of the DOSC, Form H Scores

The statistical software EQS (Bentler, 1998) was employed to perform confirmatory factor analyses using a maximum likelihood estimation method. Visual inspection of scores revealed a full range of response on all the 20 items, thus a restriction of range was not evident. Table 4 shows the summary of the results of confirmatory factor analyses performed on the three alternative factor models.

Insert Table 4 about here

The goodness-of-fit indexes are presented in terms of χ^2, χ^2/df, normed goodness-of-fit index (NFI), non-normed goodness-of-fit index (NNFI), comparative fit index (CFI), and root mean square error of measurement (RMSEA). The closer the fit of the model, the smaller the values of χ^2, χ^2/df, RMSEA, and the larger the values of the NFI, NNFI, and CFI. Ideally the χ^2 value should be statistically non-significant. A χ^2/df ratio ranging from 2 to 5 have been advocated as acceptable cutoffs (Byrne, 1989; Carmines and McIver, 1981; Marsh & Hocevar, 1985). For NNFI, NFI, and CFI, values closer to 1 indicate better fit. For the CFI particularly a value of .90 or higher has been suggested as indicating adequate fit (Bentler & Bonnet, 1980). The RMSEA is defined as $\sqrt{d}$ model/df *model*, where $d = \chi^2 - df$ divided by $N - 1$ (Loehlin, 1998). The RMSEA values below .80 are considered acceptable (Browne & Cudeck, 1993).

A χ^2 statistic for a one-factor model, a two-factor model, and a four-factor model was 896.13, 926.96, and 560.77, respectively. The four-factor model revealed the smallest value, indicating that the four-factor model was the best fit among the three models. For each model, the χ^2 was statistically significant ($p < .001$). A χ^2/df ratio of the four-factor model was smallest (3.11) among the three models, suggesting that the model was better fit than the other two alternative models. The NFI, NNFI, and CFI of the four-factor model were .685, .747, .761, respectively; for the one-factor model were .497, .553, and .556, respectively; and for the two-factor model were .480, .528, and .535, respectively. The RMSEA for all the three alternative models were .10 and higher, all suggesting a poor fit. Every criteria employed in the present study thus suggested the four-factor model was the best fit among all the competing models although it failed to meet the conventional standard of adequate fit. At the same time every criteria in the present study suggested that the *a priori* two-factor model was the worst fit among all the models.

Discussion

The present study investigated the factorial structure and dimensionality of the Japanese translation of the CAPS. The CAPS, originally developed for use by U.S. students, is a 20-item self-reporting questionnaire purporting to measure two underlying dimensions of classroom communication apprehension: *Confidence* and *Participation* (Neer, 1987). The ten even numbered items are designed to measure *Participation,* while the odd-numbered items are designed to measure *Confidence*. The Japanese version of the CAPS comprised the same items representing the same two underlying dimensions. Translation and back-translation were performed to verify accuracy translation as well as appropriateness of cultural relevance. A sample of 196 high-school students attending a college-preparatory high school in Japan completed the questionnaire. Exploratory and confirmatory factor analysis followed. Both exploratory and confirmatory factor analyses failed to recover the two originally hypothesized dimensions of CAPS (*Participation* and *Confidence*). The results instead suggested the presence of four dimensions underlying the Japanese version of the CAPS.

Inspection of items in an oblique two-factor solution suggests that items in Factor 1 (with some exceptions) would generally relate to positive attitudes toward oral communication, whereas items in Factor 2 would relate to negative attitudes. In an oblique four-factor model items indicating positive attitudes for oral communication loaded on Factor 1. In the same factor model Factor 2, 3, and 4 include all the items indicating negative attitudes. Differences separating the three negative factors might be described in terms of the respondents' skill deficiency for oral communication (Factor 2), tendency to minimize participation or withdraw from participation even when oral communication is called for (Factor 3), and tendency to avoid situations where oral communication might take place (Factor 4). In their later study Neer and Kircher (1989) state that the CAPS measures CA in classroom with four dimensions: *Communication Avoidance, Evaluation Apprehension, Communication Competence,* and *Communication Confidence*. The four factors found in this study might be compatible with the four dimensions of the CAPS; however, further investigation is required to establish such construct equivalence. However, in both studies it is

apparent the items in the CAPS represent more than two originally hypothesized dimensions of classroom CA.

Classroom CA is a complex psychological construct. It may not be explained in terms of students' confidence in and predisposition toward oral communication alone. As mentioned earlier, students in classroom are constantly observed and evaluated. Under such circumstances fear of evaluation might well affect students' levels of confidence and participation, leading otherwise competent students to withdraw. The subjects in the present study are in a highly competitive academic environment. The evaluation factor might have played even more strongly among them. The findings of the present study suggest that the theoretical framework of CA needs to be redefined and further tested. The development of a scale to measure CA in classroom should then follow.

The results of the present study need to be interpreted cautiously for a number of reasons. First, for studies such as the present study involving translation of scales, whether the findings should be attributed to the characteristics of the observed data or the translation remains a critical question. Vijver and Leung (1997) suggest that translation must reflect not only grammatical and semantic accuracy but also maintain naturalness, connotation, and comprehensibility of the original items. The Japanese translation should be reexamined in this regard. Second, the sample employed in the present study is not representative of Japanese high school students in general. They are in an accelerated program finishing a three-year high school program in their first two years in order to study solely for college entrance examinations in their third-year. The competitiveness and academic excellence required for students to be in such a program may have affected their responses to the questionnaire. The study needs to be replicated with samples representing a broad spectrum of the Japanese high-school student population.

Conclusion

The present study provided a first step toward the development of a classroom communication apprehension scale. Future studies should look into redefining the dimensions of classroom communication apprehension. Future studies should also look into the translation of the scale. Modification in translation might lead to findings other than those reported in the present study.

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Table 1

Means, Standard Deviations, and Interscale Correlations of Two Factor Subscales of the CAPS with Internal-Consistency Estimates of Reliability Along the principal Diagonal (N = 196)

Factor	Confidence	Participation	Means	SD
Confidence	(.81)	.71	28.93	7.93
Participation	.71	(.80)	26.58	6.14

Note: Correlation significant at p = .000

Table 2

Oblique (Promax) Rotation 4-Factor Solution (N = 196)

Item	Obtained Factors			
	1	2	3	4
Eigenvalue	6.77	2.84	1.56	1.08
% of Variance	33.85	14.23	7.81	5.41
9	.83			
12	.82			
15	.77			
6	.74			
18	.72			
14	.64		.30	
17		.65	.45	
13		.62		
7		.62		
19		.60		
5		.60		
11		.54		
16			.71	
4	.31		.57	
2			.47	
3		.31		.64
10	.51		.31	.60
20				.45
1			.34	.39
8			.33	.36

Note: Factor loadings less than .30 are not reported in the table.

Table 3

Oblique (Promax) Rotation 2-Factor Solution (N = 196)

Item	Obtained Factors	
	1	2
Eigenvalue	6.77	2.84
% of Variance	33.85	14.23
12	.85	
9	.84	
15	.80	
18	.75	
6	.69	
14	.66	
10	.58	.40
4	.31	
17		.75
19		.69
11		.59
7		.57
13		.55
5		.50
2		.48
3	.34	.46
1		.44
8		.43
16		.38
20		.33

Note: Factor loadings less than .30 are not reported in the table.

Table 4

Summary of Goodness-of-Fit Indices (N = 196)

Model	One-Factor Model	Two-Factor Model	Four-Factor Model
No. of Factors	1	2	4
No. of Variables	20	20	20
chi-square	896.13	926.96	560.77
df	189	187	180
df/chi-square	4.74	4.95	3.11
NFI	.497	.480	.685
NNFI	.553	.528	.747
CFI	.556	.535	.761
RMSEA	.13	.14	.10